Indiana Department of Environmental Management

2017 Recycling Activity Summary

Overview of 2017 data reported by municipal solid waste recyclers required to report recycling activities to meet the 50 percent recycling goal mandated by the Indiana legislature.

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2017 Recycling Activity Summary

The Recycling Activity Summary provides information collected from municipal solid waste (MSW) recyclers. The recyclers are legislatively required to report recycling activities under IC 13-20-25. The Indiana Department of Environmental Management (IDEM) provides the report to fulfill its requirement to report and provide an overview of 2017 state recycling data results. In the report, IDEM also evaluates Indiana's progress in achieving a 50 percent recycling goal.

The recycling rate for Indiana in 2017 increased slightly to 16.8%. The total MSW recovered for recycling and compost was 1,379,619 tons, which was up by 107,174 tons from 2016. Waste disposal also increased by 481,395 tons for a total of 6.8 million tons. Specifically, total reported shipments of recyclables from Recycling Activity Reports were 933,524 tons, a slight increase from last year as summarized in TABLE 6, on page 8.

Terms and reporting requirements

The MSW stream results from the operation of residential, municipal, commercial, or industrial establishments and community activities.

IC 13-11-2-133 states:

> "…municipal waste means any garbage, refuse, industrial lunchroom or office waste, and other similar material resulting from the operation of residential, municipal, commercial, or institutional establishments and community activities."

Therefore, recycling is the recovery of recyclable materials from the MSW stream (garbage, refuse, industrial lunchroom waste, office waste, or other similar material) for use or reuse, conversion into raw materials, or for use in the production of new products.

A recycler is defined as the owner or operator of a facility where recycling may occur, including a landfill, an incinerator, a material recovery facility (MRF) or a solid waste management district. A recycler is also defined as a recyclable materials broker who arranges the collection, transportation, delivery, recycling or reuse of recyclable materials.

Recyclers must report, in tons, the types of recyclable material from Indiana origins that it ships to in-state recycler facilities, in-state manufacturers/end users, or out-of-state destinations. IC 13-20-25 requires reporting the following types of recyclable materials:

1) Glass
2) Metal, including white goods (ferrous)
3) Metal (non-ferrous)
4) Paper and cardboard (all grades)
5) Plastic and plastic products
6) Single stream recyclable materials, and
7) Any other distinct type of recyclable material not specified in 1) through 6).

Recycling activities are required to be reported to IDEM during a calendar year (January 1 – December 31), either on an annual basis or on a quarterly basis. Recyclers must submit reports

for each facility owned or operated by the recycler where they conduct recycling activities.

Persons managing wastes not defined as municipal, such as those involved in automotive scrap metal processing, automotive salvage, or industrial wastes, are not required to report recycling of these wastes but may do so voluntarily. IDEM has included in this summary a review of all materials reported, but does not count recycling of non-MSW materials towards the 50 percent recycling goal.

The next section discusses the collection method of the information and the data reported.

Reporting method/data collection

The information recyclers are required to report includes:
1) Name and location of the recycler's establishment
2) Principal business activity conducted
3) Type of operation
4) Type of materials, including: glass, metal, paper, plastic, single stream (mixed), and other
5) Quantity, in tons, for each type of recyclable that was transported from the reporting recycler's establishment, or in the case of a recycler who is a broker, the amount of materials transported or delivered by arrangement of the recycler, and
6) Where the material was transported, which would include shipments to other in-state recycler facilities, or persons in Indiana that use the raw materials or reuse the product without further recycling, and out-of-state shipments.

Recyclers submit reports through IDEM's Solid Waste and Recycling Data Reporting Program, a web-based materials management system for aggregating data. Facility registrations are categorized by organization type for IDEM administration purposes. Organization types include landfill, transfer station, waste-to-energy plant, composting facility, processing facility, waste tire facility or recycler facility. The latter organization type is for facilities not included in the other categories.

Reporting results

IDEM received recycling activity reports from 140 Indiana facilities who handled shipments of recyclables. The facilities are grouped by registration type and principal business activity, as shown in TABLE 1 and TABLE 2, respectively. The report tracked shipments of recyclables sent to destination categories, as defined:
1) Recycler Facility - This refers to a recycling facility such as a MRF with intermediate consolidating, sorting, shredding, or baling operations. The reporting included the location of the receiving recycler facility (name/city/state).
2) Broker - This refers to shipments transported through a broker to final destinations. The reporting included the principal address of the broker (name/city/state).
3) Manufacturer/end user - This refers to a production facility of basic products that used the recyclables as a raw material without further offsite recycling. Examples included glass container mills, foundries, steel mini-mills, smelting and refining operations, plastic processors for flake and pellets, and pulp and paper mills. Reporting included the location of the receiving manufacturer/end user (state or foreign country).

TABLE 1: Number of Indiana Facilities Submitting Recycling Activity Reports by Registration Type

Registration Type	Number of Facilities Submitting Reports
Recycler Facility	76
Transfer Station	37
Compost Facility	14
Landfill	8
Waste-to-Energy Plant (Incinerator)	1
Processing Facility	2
Waste Tire Facility	2
Total	**140**

TABLE 2: Number of Indiana Facilities Submitting Recycling Activity Reports by Principal Business Activity

Principal Business Activity	Number of Facilities Submitting Reports
Solid Waste Management Company	49
Solid Waste Management District / Government	74
Business	15
Not-for-Profit	1
College / University	1
Brokers	0
Total	**140**

The shipments of recyclables (tons) by material type and destination are given in TABLE 3. Compost and e-waste are not listed since their recycling amounts are given in separate reports (see TABLE 5). The category of "Other" measures any other distinct type of recyclable material from MSW. The largest portion of this category was made up of wood waste, which may be used for mulch or animal bedding. Appendix A provides a detailed breakdown of the amount of MSW recyclables generated for shipment.

TABLE 3: Shipments of Recyclables by Material Type and Destination

MATERIAL TYPE	SHIPMENTS OF RECYCLABLES BY DESTINATION			
	In-State Recycler Facilities (Tons)	Broker Arranged Shipments (Tons)	In-State Manufacturers / End Users (Tons)	Out-of-State Destinations (Tons)
Glass	5,921	9,973	34,612	25,950
Metal, including white goods (ferrous)	26,651	339	357	905
Metal (non-ferrous)	2,413	123	150	2,484
Paper and cardboard (all grades)	30,590	147,597	214,462	123,549
Plastic	4,274	3,421	5,054	11,605
Single Stream/Mixed	78,358	8,927	7,483	119,637
Other	56,413	388	187,519	28,989
Total	**204,620**	**170,768**	**449,637**	**313,119**
Non-MSW Materials	31,587	1,625	33,154	4,362
Grand Total	**236,207**	**172,393**	**482,791**	**317,481**

An additional category of recycling from non-MSW (per statute) is listed as "Non-MSW Materials,"

in TABLE 3. It allows registrants to voluntarily record amounts of other recyclable materials from non-municipal solid waste, such as scrap metal and aggregate from construction and demolition (C&D) debris, auto bodies, and non-hazardous industrial materials. The reported amounts consist mainly of aggregates.

The next section analyzes only the MSW recycling data to determine compliance with Indiana's 50 percent recycling goal. Reported shipments of recyclables to in-state recycler facilities in TABLE 3 are excluded from the recycling rate measurement since the tonnage amounts also are required to be reported by the receiving facilities that sorts and bales the recyclables for shipment to end use markets. However, they help IDEM understand community collection efforts for curbside and drop-off sites.

Reviewing recycling numbers and MSW recycling rate

Double counting of recyclables is avoided by only including recyclables with shipment destinations as shown in TABLE 4. In 2017, the total amount of MSW recyclables reported was **933,524 tons**.

TABLE 4: Shipments of Recyclables by Material Type and Destination

	SHIPMENTS OF RECYCLABLES BY DESTINATION			
MATERIAL TYPE (MSW only)	Broker Arranged Shipments (Tons)	In-State Manufacturers / End Users (Tons)	Out-of-State Destinations (Tons)	Total (Tons)
Glass	9,973	34,612	25,950	70,535
Metal, including white goods (ferrous)	339	357	905	1,601
Metal (non-ferrous)	123	150	2,484	2,757
Paper and cardboard (all grades)	147,597	214,462	123,549	485,608
Plastic and plastic products	3,421	5,054	11,605	20,080
Single Stream/Mixed	8,927	7,483	119,637	136,047
Other	388	187,519	28,989	216,896
Total	**170,768**	**449,637**	**313,119**	**933,524**

Specifically:
- The Broker Arranged Shipments category allows recycler facilities to report transactions with a broker.
- Shipments of recyclables to in-state manufacturers/end users helps to discern circular economy benefits and recycling markets.
- Out-of-state destinations only include shipments sent to recycler facilities and/or manufacturers/end users.

Shipments by material types alone are shown in Figure 1 and Figure 2 for recyclables recovered from the MSW stream.

Figure 1: Shipments of Recyclables by Material Type (Tons)
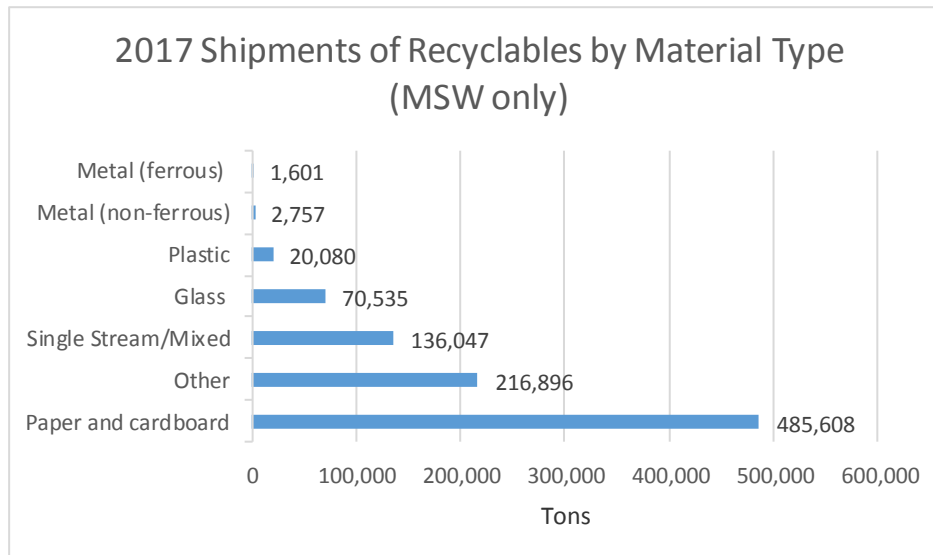
Looking at the MSW recycling data from the Recycling Activity Reports, 52 percent of the tonnage consisted of paper/cardboard, 23 percent was other, including wood waste, and 15 percent was single stream (mixed) recyclables. The least amount of tonnage included metal (both ferrous and non-ferrous), plastic, and glass, which accounted for about ten percent of the recyclable materials shipped.

Figure 2: Percentage of Recyclables Shipments by Material Type
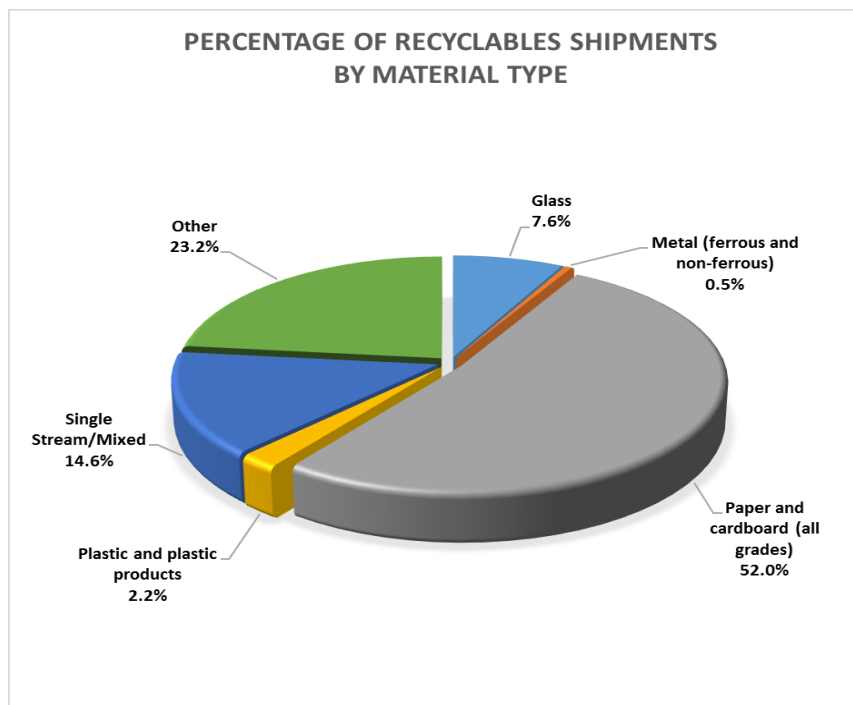
A recycling rate can be calculated to determine how Indiana is meeting its recycling goal by estimating the overall MSW generated against the materials reported as recyclable.[1] The measurement standard established by the U.S. Environmental Protection Agency (U.S. EPA) is:

Recycling Rate (%) = MSW Recovered for Recycling and Composting (tons) / MSW Generation (tons) x 100

The MSW generation is the sum of tonnage amounts as reported in TABLE 5 for each of the waste management classifications. Tonnage estimates from Indiana origins are given with supporting data references.

TABLE 5: Indiana MSW Generation and Classification (2017)

Classification	Tons	Data Reference
Disposal through Landfilling (in-state)	5,941,080	The data are aggregated from IDEM Solid Waste Land Disposal Facility reports. This is the total amount of MSW from Indiana origins received at in-state landfills for disposal. It does not include non-hazardous industrial process wastes, and construction and demolition (C&D) debris.
Disposal through Landfilling (out-of-state)	499,967	This amount was estimated from Indiana exports of MSW as reported by neighboring states. Other supporting data included Solid Waste Processing Facility reports of waste sent for disposal at out-of-state landfills from Indiana transfer stations as well as direct haul reports for solid waste to out-of-state destinations.
Energy from Waste	398,196	The data are aggregated from Solid Waste Processing Facility reports. This is the total amount of MSW from Indiana origins received at the Indianapolis Resource Recovery facility for disposal. It does not include non-hazardous industrial process wastes, and C&D debris.
Recycling	933,524	The data are aggregated from Recycling Activity Reports. This is the total amount of recyclables from MSW as reported by shipments to (a) in-state manufactures/end users, (b) out-of-state destinations, and (c) arranged through brokers.
Composting	412,446	The data are aggregated from Registered Composting Facility Reports. This is the total estimated amount of waste received at Indiana compost facilities including yard trimmings, food waste, and other organic materials. It does not include wood waste processed into mulch.
E-waste Recycling	33,649	The data are aggregated from IDEM, Electronics Recycling Annual Report and E-Cycle Collector/Recycler Registration reports. The data is for all types of e-waste including covered electronic devices for Indiana's E-Cycle program. Total shipments are tracked by destination categories.
Total	**8,218,862**	

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[1] Standardized definitions for determining a recycling rate are described in the U.S. EPA publication, "Measuring Recycling: A Guide for State and Local Governments (http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=100011CF.txt) or (http://infohouse.p2ric.org/ref/01/00801/). Also, EPA's most recent report, "Advancing Sustainable Materials Management: 2015 Fact Sheet," gives national statistics for MSW generation, recycling, and disposal (https://www.epa.gov/sites/production/files/2018-07/documents/2015_smm_msw_factsheet_07242018_fnl_508_002.pdf).

In addition to the Recycling Activity Reports, information was reviewed from other IDEM reports as submitted through IDEM's Solid Waste and Recycling Data Reporting Program to calculate the MSW generation. These include:

1) Solid Waste Land Disposal Facility Report
2) Solid Waste Processing Facility Report
3) Registered Composting Facility Report
4) Electronics Recycling Annual Report and E-cycle Collector / Recycler Registration (E-waste)
5) Annual Tire Report

The total recycled is the sum of recycling, compost, and e-waste amounts listed in TABLE 5. With this in mind, the calculation is made accordingly:

MSW Recovered for Recycling and Composting
= 933,524 + 412,446 + 33,649 = 1,379,619 tons

The 2017 Indiana Recycling Rate then is calculated as:
(1,379,619 tons / 8,218,862 tons) x 100 = 16.8%

Discussion of results

Indiana's 2017 recycling rate was 16.8 percent, slightly higher than last year. The total of MSW recovered for recycling and compost was 1,379,619 tons, up by 107,174 tons but waste disposal was higher by 481,395 tons for a total of 6.8 million tons. Specifically, total reported shipments of recyclables from Recycling Activity Reports were 933,524 tons, a slight increase from last year as summarized in TABLE 6 and Figures 3 and 4.

TABLE 6: Shipments of Recyclables by Material Type and Year

Material Type (MSW only)	2015 (Tons)	2016 (Tons)	2017 (Tons)
Glass	6,432	16,936	70,535
Metal, including white goods (ferrous)	3,379	1,518	1,601
Metal (non-ferrous)	3,479	2,794	2,757
Paper and cardboard (all grades)	192,838	628,494	485,608
Plastic and plastic products	15,002	18,552	20,080
Single Stream/Mixed	84,968	69,510	136,047
Other	161,220	161,924	216,896
Total	**467,318**	**899,728**	**933,524**

Figure 3: Shipments of Recyclables by Material Type and Year

Shipments of Recyclables by Material Type and Year

Legend: 2017, 2016, 2015

Material Type	2017	2016	2015
Other	216,896	161,924	161,220
Single Stream/Mixed	136,047	69,510	84,968
Plastic and plastic products	20,080	18,552	15,002
Paper and cardboard (all grades)	485,608	628,494	192,838
Metal (ferrous and non-ferrous)	4,358	4,312	6,858
Glass	70,535	16,936	6,432

Tonnage
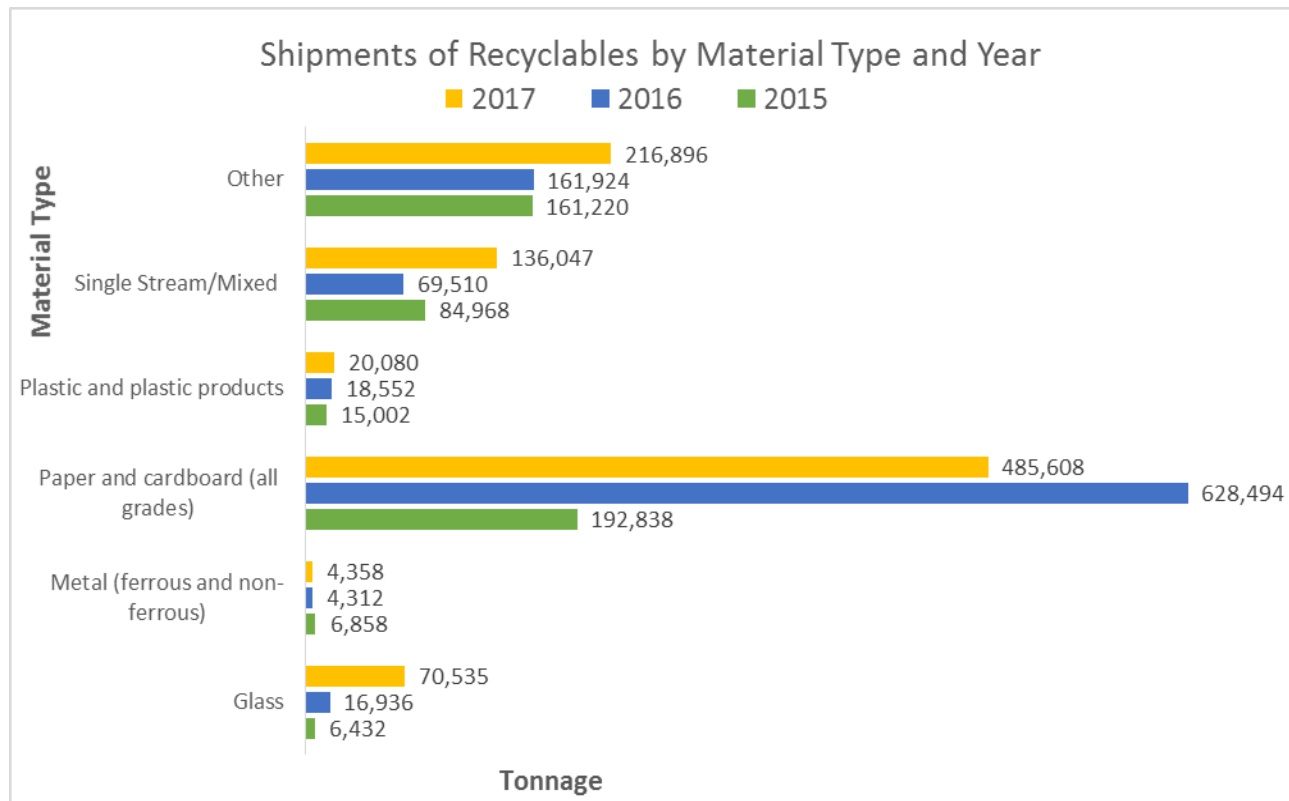
Figure 4: Total Amount of Recyclables by Year (2015-2017)

Shipments of Recyclables by Year

933,524 (2017)
899,728 (2016)
467,318 (2015)

Tonnage / Year
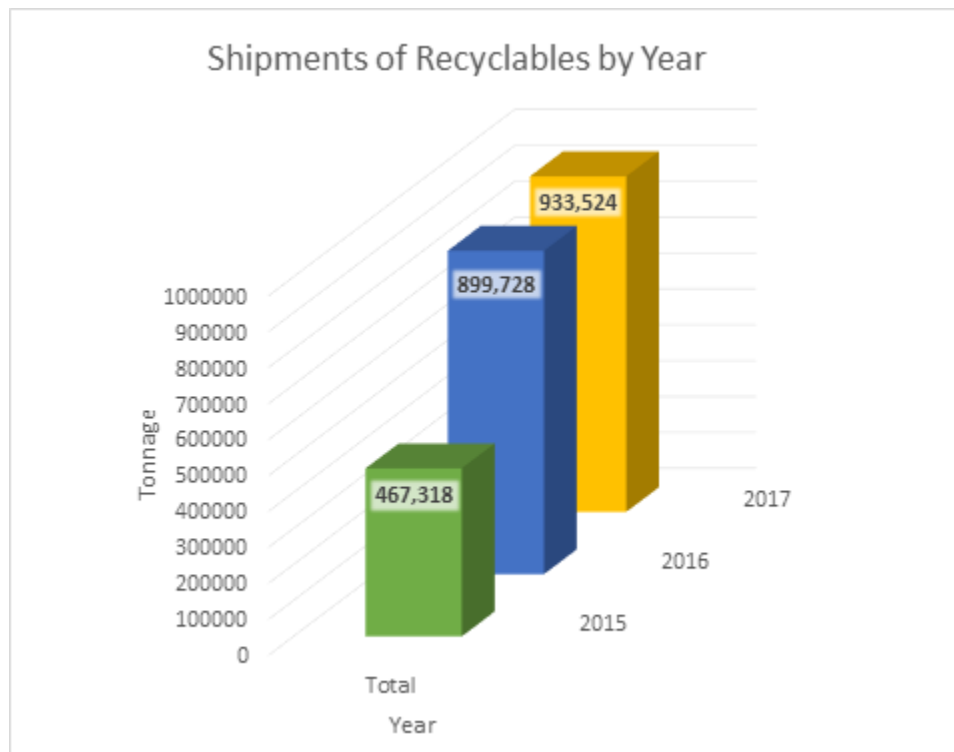
Reporting highlights include:

- Glass shipments were up by 53,599 tons from 2016. This is mainly as a result of new first-time reporting by glass recycler facilities.
- Paper and cardboard tonnage was down by 142,886 tons from 2016. Part of the decrease was due to non-reporting from facilities that had shipments last year.
- The number of reporting facilities was 140, which included four first-time reports from facilities. Reporting facilities with no shipments of recyclables are excluded.
- Single stream/Mixed amounts are up from 2016 with higher shipments to out-of-state destinations for processing. It also reflects an increase of community curb-side collection.
- The "Other" category of Recycling Activity Reports consists mainly of wood waste for mulch and animal bedding markets. It does not include compost shipments. The increase of 54,972 tons includes new first-time reporting by facilities.
- Recycled metal amounts from MSW are low. Additional outreach is needed for scrap metal processors to report tonnages of scrap from MSW. Per statute, these type of facilities are not required to submit recycling reports.
- Out-of-state waste disposal of MSW was higher than 2016. Tonnage amounts from direct hauls were included this year.

Reporting challenges

The most difficult step of determining the success of recycling is identifying the universe of companies and materials. IDEM began building a user friendly data system for customers in 2015. Challenges included getting familiar with the on-line reporting system and getting the word out to recyclers, communities, and the solid waste management industry as a whole about Indiana's measurement approach and mandatory reporting requirements for recyclables.

While waste disposal is a one-stop solution for materials management, recycling offers circular economy benefits with more jobs, conservation of resources, and less pollution. Recycling rate measurements are integral to solid waste planning and are supported by the solid waste industry [2].

Important parameters include:

- The reporting methodology needs to be clearly defined and transparent. It serves as a basis for a more detailed analysis of the data.

- Continued efforts are needed to highlight Indiana's strong manufacturing base for use of recyclables and economic benefits. This includes steel production, pulp and paper mills, glass container mills, fiberglass production, and plastic processors.

- IDEM messaging and education, policy directives, and incentives are supportive of recycling activities and require baseline metrics to track progress.

- Business and community leaders should encourage recyclers to be compliant with the reporting requirements. The recycling data will help identify where materials are available or where more work with recyclers needs to be done to keep commodities separate from trash.

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[2] The Solid Waste Association of North America (SWANA) supports the measuring of recycling as a part of an integrated solid waste management program. They are developing a technical policy on measuring recycling rates that follows EPA's definitions and methodology for a weight-based approach.

Conclusion

IDEM strives to provide accurate data regarding recycling and waste material management. The reporting of actual recycling numbers by recyclers provides credibility in achieving recycling goals and helps to determine long term infrastructure needs for sustainable materials management. The information provided is a conservative account and as the agency continues to better understand the recycling community, the numbers should not only increase, but help recognize recycling efforts throughout the state.

APPENDIX A.

APPENDIX A: AMOUNT OF RECYCLABLES GENERATED FROM EACH COUNTY FOR SHIPMENT

County Location of Reporting Facilities	Shipments to In-State Recycler Facilities (tons)	Shipments through a Broker (tons)	Shipments to In-State Indiana Manufactures/ End Users	Shipments to Out-of-State Destinations (tons)
Adams	679		68	30
Allen	15,841	719	15,725	12,003
Bartholomew	1,494		16,633	450
Benton	9			237
Blackford			32,981	21,987
Boone	121		22,670	
Brown	174			194
Carroll	316			
Cass	535			
Clark	19,756		1,711	17,742
Clay				
Clinton				
Crawford	16			210
Daviess	39			
DeKalb	5			
Dearborn	317	1,223		216
Decatur	5,960			
Delaware	512	6,074	4,980	902
Dubois	481			
Elkhart	5,055	59,674	54,967	10,185
Fayette	509			
Floyd				619
Fountain	310			15
Franklin	0			
Fulton		270	652	108
Gibson	263	54		17
Grant	1,702			
Greene				
Hamilton	1,581		30,956	
Hancock		150		
Harrison				
Hendricks	17,266		15,253	65,096
Henry	710			
Howard	815			
Huntington	1,026			
Jackson	563		1,483	2,854
Jasper	57		84	491
Jay	350			
Jefferson	88	1253	2	587
Jennings				

Johnson	2,410			
Knox	1,094	85		
Kosciusko	2,594			
La Porte				8,936
Lagrange				
Lake	33,079	8,548	71,006	73,067
Lawrence	234	607		
Madison	3,100	7,761	207	
Marion	17,772	42,883	47,111	57,123
Marshall	326			
Martin		2,098		
Miami	1,587			
Monroe	6,740	4,360		
Montgomery	9,672	13		985
Morgan	902			
Newton	285			
Noble				
Ohio				
Orange	7			
Owen				
Parke				
Perry	103	445		
Pike	108			
Porter	3,756	108	120,768	24,535
Posey	73	785		101
Pulaski	122	593	199	
Putnam	832			
Randolph	841			
Ripley				
Rush	121			
Scott				
Shelby	1,350	2,250		3,703
Spencer	135	562	53	288
St. Joseph	14,721	2,703	5,160	2,576
Starke				
Steuben	3,544			
Sullivan				
Switzerland				
Tippecanoe	9,723			6,076
Tipton	323			
Union				
Vanderburgh	39	25,402	6,642	362
Vermillion				
Vigo	1,567	816		
Wabash	5,430			
Warren		433		
Warrick	886	670	25	
Washington	362			
Wayne	703			404

Wells	34			308
White	346	229	301	712
Whitley	3,149			
Total	**204,620**	**170,768**	**449,637**	**313,119**

Note: The data are aggregated from Re-TRAC 2017 Recycling Activity Reports for Recyclables from municipal solid waste (MSW). The data are aggregated by county location of each reporting facility. The amount of recyclables is blank if the county was part of a multiple solid waste management district, had no reporting facilities, or submitted no data.